

AMENDMENTS TO THE CLAIMS

1.(currently amended): A transmission system for controlling the transmission of a concatenation signal ~~via a path~~, the system comprising:

a sending apparatus including:

signal dividing means for dividing the concatenation signal to generate a plurality of divided signals which are ~~pseudo~~ concatenation signals having a SONET or SDH multiplexed interface, the bit rate of which is lower than that of the original concatenation signal, according to a bit rate available for a transmission line;

guarantee information adding means for adding guarantee information, for guaranteeing the continuity of the divided signals, to each of the divided signals to generate transmission signals; and

signal sending means for assigning the transmission signals to transmission lines to have capacity that is suitable for service contents and sending the transmission signals to one address, in parallel via a plurality of the transmission lines on which the bit rate is limited; and

a receiving apparatus including:

signal receiving means for receiving the transmission signals; and

signal restoring means for restoring the original concatenation by constructing the divided signals on the basis of the guarantee information.

2. (previously amended) The transmission system according to claim 1, wherein the guarantee information adding means adds at least one of the information regarding the type of

the concatenation signal, the frame number of the concatenation signal, and a division number at the time of dividing the concatenation signal to the divided signal as the guarantee information.

3. (original) The transmission system according to claim 1, wherein the guarantee information adding means adds the guarantee information in empty bytes of a path overhead for the divided signal.

4. (original) The transmission system according to claim 1, wherein the receiving apparatus further includes delay information notifying means for giving the sending apparatus delay information regarding delays which have occurred at the time of receiving the transmission signals.

5. (previously amended) The transmission system according to claim 4, wherein on the basis of the delay information, the signal sending means sets the bit rate of each transmission signal variable and makes delay correction.

6. (original) The transmission system according to claim 4, wherein the signal sending means overlaps portions of the transmission signals and sends the transmission signals.

7. (original) The transmission system according to claim 6, wherein when the signal receiving means receives the transmission signals, the signal receiving means makes delay correction by making use of an overlap.

8. (currently amended) A sending apparatus for controlling the sending of a concatenation signal ~~via a path~~, the apparatus comprising:

signal dividing means for dividing the concatenation signal to generate a plurality of divided signals which are ~~pseudo~~ concatenation signals having a SONET or SDH multiplexed interface the bit rate of which is lower than that of the original concatenation signal, according to a bit rate available for a transmission line;

guarantee information adding means for adding guarantee information, for guaranteeing the continuity of the divided signals, to each of the divided signals to generate transmission signals; and

signal sending means for assigning the transmission signals to transmission lines to have capacity that is suitable for service contents and sending the transmission signals to one address, in parallel via a plurality of the transmission lines on which the bit rate is limited.

9. (cancelled)

10. (withdrawn) A transmission system for controlling the transmission of a multiplexed signal via a section, the system comprising:

a sending apparatus including:

signal dividing means for dividing the multiplexed signal to generate a plurality of divided signals in the STS or STM transmission interface format:

guarantee information adding means for adding guarantee information for guaranteeing the continuity of the divided signals to each of the divided signals; and

WDM signal sending means for converting the divided signals to which the guarantee information is added to optical signals with wavelength different from one another to perform wavelength multiplexing on the optical signals and sending the optical signals; and a receiving apparatus including:

WDM signal receiving means for receiving the optical signals, separating the optical signals according to wavelengths, and converting the optical signals to the divided signals; and

signal restoring means for constructing the divided signals on the basis of the guarantee information to restore the multiplexed signal.

11. (withdrawn) The transmission system according to claim 10, wherein the guarantee information adding means adds at least one of information regarding the type of the multiplexed signal, the frame number of the multiplexed signal, the frame number of the multiplexed signal, and a division number at the time of dividing the multiplexed signal to the divided signal as the guarantee information.

12. (withdrawn) The transmission system according to claim 10, wherein the guarantee information adding means adds the guarantee information in byte C1 of a relay section overhead for the divided signal.

13. (withdrawn) A sending apparatus for controlling the sending of a signal via a section, the apparatus comprising:

signal dividing means for dividing a multiplexed signal to generate a plurality of divided signals in the STS or STM transmission interface format;

guarantee information adding means for adding guarantee information for guaranteeing the continuity of the divided signals to each of the divided signals; and

WDM signal sending means for converting the divided signals to which the guarantee information is added to optical signals with wavelengths different from one another to perform wavelength multiplexing on the optical signals and sending the optical signals.

14. (withdrawn) A receiving apparatus for controlling the receiving of a signal via a section, the apparatus comprising:

WDM signal receiving means for receiving wavelength-multiplexed optical signals, separating the optical signals according to wavelengths, and converting the optical signals to divided signals generated by dividing a multiplexed signal; and

signal restoring means for restoring the multiplexed signal by constructing the divided signals on the basis of the guarantee information for guaranteeing the continuity of the divided signals included in the divided signals.

15. (new) A transmission system for controlling the transmission of a concatenation signal, the system comprising:

a sending apparatus including:

signal dividing means for dividing, according to a bit rate available for a transmission line, the concatenation signal to generate a plurality of divided signals which are concatenation signals having a SONET or SDH multiplexed interface, the bit rate of which is lower than that of the original concatenation signal;

guarantee information adding means for adding guarantee information for guaranteeing the continuity of the divided signals to each of the divided signals to generate transmission signals;

signal sending means for assigning the transmission signals to transmission lines to have capacity that is suitable for service contents and sending the transmission signals to one address, in parallel via a plurality of the transmission lines on which the bit rate is limited;

a receiving apparatus including:

signal receiving means for receiving the transmission signals;

signal restoring means for restoring the original concatenation by constructing the divided signals on the basis of the guarantee information; and

wherein the receiving apparatus further includes delay information notifying means for giving the sending apparatus delay information regarding delays which have occurred at the time of receiving the transmission signals;

and wherein the signal sending means calculates the bit rates of the divided signals respectively on the basis of the delay information;

and wherein the signal dividing means divides the concatenation signal to meet the conditions that $X_1 + \dots + X_n = X$, that all the divided signals should reach by time t_1 , and that $X_1 \geq X_2 \geq \dots \geq X_n$

where X is the bit rates of the concatenation signal and $X_1 - X_n$ are the bit rates of the divided signals and t_1 is a receiving end time of a divided signal which arrived at the receiving apparatus fastest.

16. (new) A transmission system for controlling the transmission of a concatenation signal, the system comprising:

a sending apparatus including:

signal dividing means for dividing, according to a bit rate available for a transmission line, the concatenation signal to generate a plurality of divided signals which are concatenation signals having a SONET or SDH multiplexed interface, the bit rate of which is lower than that of the original concatenation signal;

guarantee information adding means for adding guarantee information for guaranteeing the continuity of the divided signals to each of the divided signals to generate transmission signals;

signal sending means for assigning the transmission signals to transmission lines to have capacity that is suitable for service contents and sending the transmission signals to one address, in parallel via a plurality of the transmission lines on which the bit rate is limited;

a receiving apparatus including:

signal receiving means for receiving the transmission signals;

signal restoring means for restoring the original concatenation by constructing the divided signals on the basis of the guarantee information; and

wherein the receiving apparatus further includes delay information notifying means for giving the sending apparatus delay information regarding delays which have occurred at the time of receiving the transmission signals;

and wherein the signal sending means calculate the bit rates of divided signals respectively on the basis of the delay information;

and wherein the bit rate BR is given by $BR = X * (T / (T - t))$

where X is the bit rate of a first divided signal which arrives at the receiving apparatus fastest and T is time distance from a receiving start time (t_0) of the first divided signal to a receiving end time (t_1) and t is the delay information, is a value for a difference of the time (t_1) and a receiving end time of a second divided signal which arrives at the receiving apparatus later than the first divided signal.

17. (new) A transmission system for controlling the transmission of a concatenation signal, the system comprising:

a sending apparatus including:

signal dividing means for dividing, according to a bit rate available for a transmission line, the concatenation signal to generate a plurality of divided signals which are concatenation signals having a SONET or SDH multiplexed interface, the bit rate of which is lower than that of the original concatenation signal;

guarantee information adding means for adding guarantee information for guaranteeing the continuity of the divided signals to each of the divided signals to generate transmission signals;

signal sending means for assigning the transmission signals to transmission lines to have capacity that is suitable for service contents and sending the transmission signals to one address, in parallel via a plurality of the transmission lines on which the bit rate is limited;

a receiving apparatus including:

signal receiving means for receiving the transmission signals;

signal restoring means for restoring the original concatenation signal by constructing the divided signals on the basis of the guarantee information; and

wherein the signal sending means overlaps a leading section of a divided signal and a delayed portion of another divided signal and sends them.